Claims

1 (Canceled)

2 (Previously presented): Complex polarizer system according to claim 31, each Pi being a cartesian polarizer, and their normal vectors being coplanar.

3 (Previously presented): Complex polarizer system according to claim 2, said first polarizing layer vector (V1) being perpendicular to said second polarizing layer vector (V2).

4 (Previously presented): Complex polarizer system according to claim 3, said second and said third polarizing beam splitting layers (P2, P3) being part of a common polarizing beam splitting layer with a common polarizing layer vector.

5 (Previously presented): Complex polarizer system according to claim 31, comprising at least one composed prism with a triangular base comprising a first and a second right sub-prisms (T1, T2) each with an isosceles triangular base;
the lateral surface of the second sub-prism (T2), which faces the first sub-prism (T1) carrying a cartesian polarization layer;
the lateral surface of the first sub-prism (T1), which together with a lateral surface of the second sub-prism (T2) forms a common lateral surface of said composed prism, carrying a cartesian polarization layer.

6 (Previously presented): Complex polarizer system according to claim 31, comprising a right prism with an isosceles triangular base;
both lateral surfaces of equal size of said prism carrying a polarization layer.

7 (Previously presented): Complex polarizer system according to claim 31, comprising a fourth polarizing beam splitting layer (P4) which together with said second polarizing beam splitting layer (P2) and said third polarizing beam splitting layer (P3) constitutes an additional complex polarizer system according to claim 31.

8 (Previously presented): Complex polarizer system according to claim 7, said first polarizing beam splitting layer (P1) and said fourth polarizing beam splitting layer (P4) being coplanar and having a common layer vector, and said second polarizing beam splitting layer (P2) and said third polarizing beam splitting layer (P3) being coplanar and having a common layer vector.

9 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) comprising

at least two polarizing layers Pi (i=1,2,..);

said Pi characterized by a normal vector Ni normal to Pi and a polarizing layer vector Vi coplanar to Pi;

said Pi having beam splitting properties, which split an incident beam into a transmitting and a reflected beam;

said Vi and the reflected beam spanning the plane of polarization of the reflected beam;

said Vi and the transmitting beam spanning a plane perpendicular to the plane of polarization of the transmitting beam;

P1 and a further polarizer being arranged along a first optical path S1 such that the plane E1 is spanned by V1 and the optical axis of S1 in P1, and the plane E2 is spanned by the polarizing layer vector of said further polarizer and the optical axis of S1 in said further polarizer;

said two polarizing layers being mutual complementary, characterized by

the plane E1*, derived from E1 by optional means for folding, being perpendicular to E2;

P1 and a further polarizer being arranged along a second optical path S2 such that the plane E3 is spanned by V1 and the optical axis of S2 in P1, and a plane E4 is spanned by the polarizing layer vector of said further polarizer and the optical axis of S2 in said further polarizer;

said two polarizing layers being mutual complementary, characterized by the plane E3*, derived from E3 by optional means for folding, being perpendicular to E4;

said two optical paths S1 and S2 intersecting in P1 with equal cutting angles between N1 and S1 and between N1 and S2;

the architecture of the system coupling the transmission at P1 to a reflection at the further polarizer along S1 and the corresponding reflection at P1 to a transmission at the further polarizer along S2.

10 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) comprising

at least three polarizing layers Pi (i=1,2,3,..);

said Pi characterized by a normal vector Ni normal to Pi and a polarizing layer vector Vi coplanar to Pi;

said Pi having beam splitting properties, which split an incident beam into a transmitting and a reflected beam;

said Vi and the reflected beam spanning the plane of polarization of the reflected beam;

said Vi and the transmitting beam spanning a plane perpendicular to the plane of polarization of the transmitting beam;

P1 and P2 being arranged along a first optical path S1 such that the plane E1 is spanned by V1 and the optical axis of S1 in P1, and the plane E2 is spanned

by V2 and the optical axis of S1 in P2;

said polarizing layers P1 and P2 being mutual complementary, characterized by the plane E1*, derived from E1 by optional means for folding, being perpendicular to E2;

P1 and P3 being arranged along a second optical path S2 such that the plane E3 is spanned by V1 and the optical axis of S2 in P1, and a plane E4 is spanned by V3 and the optical axis of S2 in P3;

said polarizing layers P1 and P3 being mutual complementary, characterized by the plane E3*, derived from E3 by optional means for folding, being perpendicular to E4;

said two optical paths S1 and S2 intersecting in P1 with equal cutting angles between N1 and S1 and between N1 and S2;

the architecture of the system coupling the transmission at P1 along S1 to a reflection at P2 and the corresponding reflection at P1 to a transmission at P3 along S2.

11 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) according to claim 10,

comprising an additional fourth polarizing layer P4, which together with said P2 along a third optical path S3 and together with said P3 along a fourth optical path S4 constitutes an additional cross-polarizer according to claim 10.

12 (Canceled)

13 (Previously presented): Complex polarizer system according to claim 31, said Pi being cartesian polarizers.

14 (Previously presented): Complex polarizer system according to claim 31,

said Pi being thin-film polarizers of the MacNeille type.

15 (Previously presented): Complex polarizer system according to claim 31, said polarizing beam splitting layers Pi being contained in a body with windows or openings.

16 (Previously presented): Complex polarizer system according to claim 31, further comprising
at least two spatial light modulators;
said complex polarizer system being used to feed the spatial light modulators with polarized light.

17 (Previously presented): Complex polarizer system according to claim 31, further comprising
at least two spatial light modulators;
said complex polarizer system being used to superpose the modulated light from the spatial light modulators.

18 (Previously presented): Complex polarizer system according to claim 31, further comprising
at least two spatial light modulators of the type micro-electro-mechanical-system (MEMS);
said complex polarizer system being used to feed the spatial light modulators with polarized light and to superpose the modulated light from the spatial light modulators.

19 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) according to claim 9, further comprising at least one spatial light

modulator positioned in said optical paths S1 and S2 between P1 and P2.

20 (Previously presented): Complex polarizer system according to claim 15, further comprising at least one spatial light modulator which is mounted to the body.

21 (Previously presented): Complex polarizer system according to claim 31, comprising at least one right triangular prism;

said prism being a compound prism composed of two right triangular sub-prisms with the base of an isosceles triangle each, with said first polarizing beam splitting layer (P1) being a thin-film type polarizing beam splitting layer which is situated between these two sub-prisms;

the lateral surface of the compound prism which consists of two lateral surfaces of the sub-prisms carrying said second polarizing beam splitting layer (P2) which is a cartesian type polarizing beam splitting layer;

said second polarizing layer vector (V2) being perpendicular to said first polarizing layer vector (V1).

22 (Previously presented): Complex polarizer system according to claim 31, comprising at least one right triangular prism;

said prism being a compound prism composed of two right triangular sub-prisms with the base of an isosceles triangle each, with said first polarizing beam splitting layer (P1) being a cartesian type polarizing beam splitting layer which is situated between these two sub-prisms;

the lateral surface of the compound prism which consists of two lateral surfaces of the sub-prisms carrying said second polarizing beam splitting layer (P2) which is a cartesian type polarizing beam splitting layer.

23 (Previously presented): Complex polarizer system according to claim 31, comprising at least one right triangular prism;
this prism being a compound prism composed of two right triangular sub-prisms (T1a, T1b) with the base of an isosceles triangle each;
those lateral surfaces of the compound prism which consist of only one lateral surface of the sub-prisms carrying said first and second polarizing beam splitting layers (P1, P2).

24 (Previously presented): Complex polarizer system according to claim 31, comprising at least one right triangular prism;
said prism being composed of two right sub-prisms with the base of an isosceles triangle each;
said first polarizing beam splitting layer (P1) being a thin-film type polarizing beam splitting layer which is situated between these two sub-prisms.

25 (Canceled)

26 (Previously presented): Method of complex polarization,
using a complex polarizer system according to claim 31 to split a beam into two linearly polarized sub-beams.

27 (Canceled)

28 (Canceled)

29 (Canceled)

30 (Canceled)

31 (Currently amended) Complex polarizer system,

comprising an arrangement of at least three polarizing beam splitting layers Pi, wherein i= 1, 2, 3 or 4;

each Pi being characterized by its polarizing layer vector Vi, whereas Vi equals the direction vector of the intersection line of Pi and the plane of polarization of any light beam reflected by Pi without additional polarization rotating components;

a first polarizing beam splitting layer (P1) being configured to split an unpolarized light beam propagating along a first axis (A1) into a transmitted linearly polarized light beam transmitted by first polarizing beam splitting layer (P1), and a reflected linearly polarized light beam reflected by first polarizing beam splitting layer (P1) along a second axis (A2);

a second polarizing beam splitting layer (P2) being arranged along the first axis (A1) such that

the first axis (A1) and [[a]] <u>the</u> second polarizing layer vector (V2) span a plane which is normal to the plane spanned by the first axis (A1) and [[a]] <u>the</u> first polarizing layer vector (V1),

the second polarizing beam splitting layer (P2) and the first polarizing beam splitting layer (P1) therefore being configured as a polarizing beam splitting system,

wherein the transmitted linearly polarized beam which was transmitted by the first polarizing beam splitting layer (P1) along the first axis (A1) is reflected at the second polarizing beam splitting layer (P2) without interjacent polarization rotating components, ~~e.g. without~~ wave plates or active rotators, between the first and the second polarizing beam splitting layers (P1, P2);

a third polarizing beam splitting layer (P3) being arranged along the second axis

(A2) such that

the second axis (A2) and [[a]] the third polarizing layer vector (V3) span a plane which is normal to the plane spanned by the second axis (A2) and the first polarizing layer vector (V1),

the third polarizing beam splitting layer (P3) and the first polarizing beam splitting layer (P1) therefore being configured as a polarizing beam splitting system

wherein the reflected linearly polarized beam reflected by the first polarizing beam splitting layer (P1) into the second axis (A2) is transmitted at the third polarizing beam splitting layer (P3) without interjacent polarization rotating components, ~~e.g. without~~ wave plates or active rotators, between the first and the third polarizing beam splitting layers (P1, P3).

32 (Previously presented): Complex polarizer system according to claim 31,

comprising at least one right triangular prism;

at least one lateral surface of said prism carrying a polarizing beam splitting layer Pi.

33 (Previously presented): Complex polarizer system according to claim 32,

two lateral surfaces of said prism carrying polarizing beam splitting layers.

34 (Previously presented): Complex polarizer system according to claim 8,

said first and fourth polarizing beam splitting layers (P1, P4) being polarizing beam splitting layers of the thin-film type;

said second and third polarizing beam splitting layers (P2, P3) being polarizing beam splitting layers of the cartesian type.

35 (Previously presented): Complex polarizer system according to claim 31, all of said Pi being wire grid polarizers.

Hagelstadt, 7. Dec. 2010